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CENTRAL INTELLIGENCE AGENCY

INFORMATION FROM FOREIGN DOCUMENTS OR RADIO BROADCASTS

REPORT

CD NO.

STAT

COUNTRY USSR

SUBJECT Scientific - Electricity, electrical equipment

DATE OF INFORMATION 1950

HOW PUBLISHED Monthly periodical

DATE DIST. 25 Nov 1952

WHERE PUBLISHED Moscow

NO. OF PAGES 4

DATE PUBLISHED Apr 1950

LANGUAGE Russian

SUPPLEMENT TO REPORT NO.

THIS IS UNEVALUATED INFORMATION

SOURCE Promyshlennaya Energetika, No 4, 1950, pp 14-16.

[The following presents information on certain developments in the Soviet electrical equipment industry, as of April 1950.]

PRODUCTION OF ELECTRICAL EQUIPMENT IN SOVIET MANUFACTURING PLANTS

Compiled by R. Ye. Gel'man, Engineer

Hermetically Sealed Type TMU-50/6 Transformers. The Moscow Transformer Plant (MTZ) of the Ministry of the Electrical Industry has put out an experimental lot of hermetically sealed, three-phase transformers with natural oil cooling, Type TMU-50/6 (three-phase, oil, sealed), rated at 50 kva, 6,000 ±5%/400 v. The sealed-tank construction should appreciably lengthen the life of the transformer oil and of the transformer as a whole. Oil tests are to be made one year after installation, and then every 3-5 years.

Electric-Machine Amplifiers [Amplidynes]. The Moscow Electromechanical Plant of the Ministry of the Electrical Industry has put out machines of the following types: EMU-25 for 2.5 kw, 115 and 230 v; EMU-50 for 5 kw, 230 v. In operational properties the amplifier is a low-inertia dc generator with four independent control windings, each of which can, provide for an extended period fivefold (or more) ampere-turns as compared with normal. A characteristic feature of these machines is the low power consumption of each of these control (excitation) windings, of the order of 0.5-0.7 w, when the output power of the amplifiers is 2.5 and 5 kw.

It is planned to manufacture amplifiers of the EMU series with lower (from 0.25 kw) and higher (up to 10 kw) power with an input power in each control winding of the order of 0.4-0.7 w.

Automatic Air Circuit Breakers With Time Delay. The Ul'yanovsk Electrical Equipment Plant of the Ministry of the Electrical Industry has begun manufacture of automatic time-delay breakers, type A2030B and A2030N for 800 amp and A2050B and A2050N for 1,500 amp for 250-v ac and dc networks. The A2030B and A2050B breakers are selective; they open the circuit with a time delay both during short circuits

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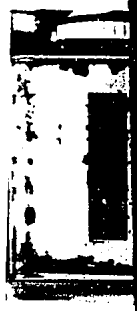

(variable delay 0.25-0.6 sec) and at overloads (two or three releases, with timing mechanism, settings up to 10 sec). The selective breakers will not trip in cases where excessive current (overload or short circuit) is disconnected by another breaker in the same circuit but installed closer to the source of trouble and set for quicker operation. In this manner, only the section where abnormal phenomena occur is disconnected, while the major part of the installation continues to receive power.

Breakers A2030N and A2050N are disconnected with time delay only during overloads, i. e., they are not selective since protection is instantaneous during short circuits.

A supplementary minimum or independent release may be installed in the A2030N and A2050N breakers. Three-pole breakers of the A2030B type with two maximum releases can also be used with a disconnecting release for remote-control operation.

The coils for maximum /current/ release are made for the following currents: 100, 140, 200, 300, 400, 550, 800 amp (A2030B, A2030N) and 1,500 amp (A2050B, 2050N). The coils for minimum release are made for 110, 220, 380, 500 v, direct current, and 127, 220, 380 and 500 v, alternating current. The coils of the electromagnetic drive mechanism (see below) and also of the delay mechanism are intended for 110 and 220 v, alternating current.

All breakers are furnished either with a shaft or lever drive, but the 1,500 amp A2050N breaker can be made with an electromagnetic drive.

The over-all dimensions of the time-delay breakers are the same as those given in the catalogue "Automatic Air Circuit Breakers," TsBTI MEP (Central Bureau of Technical Information, Ministry of the Electrical Industry), 1948.

Group Lighting Switchboards and Power Distribution Points With Automatic Apparatus. The Khar'kov Electromechanical Plant (KhEMZ), Ministry of the Electrical Industry, designed, and, in 1950, began to manufacture: (a) three-phase group lighting switchboards with automatic control of 8, 12, 16, 20 and 30 circuits, weighing, respectively, 26, 30, 34, 38 and 50 kg; (b) three-phase power distribution points with three-pole automatic controls for ten 50-amp circuits (weight 83 kg), eight 50-amp and one 100-amp circuits (80 kg); six 50-amp and two 100-amp circuits (77 kg), six 50-amp circuits (64 kg), four 50-amp and one 100-amp circuit (62 kg), two 50-amp and one 200-amp circuit (62 kg), ten 50-amp circuits with neutral busbar, with panel doors.

Total width of lighting switchboards, 604 mm; height, 540-925 mm; total width of power points /distribution units/, 850 mm; height, 850-1,160 mm (height of switchboards and power points depends on number of automatic switching circuits).

600 and 1,000 Amp Knife Switches and Changeover Switches. The Moscow Electromechanical Plant, Ministry of the Electrical Industry, is manufacturing knife and changeover switches with a central arm and lever drive for 600 and 1,000 amp, 500 v. These switches are required to pass interrupting tests at rated current, 220 v dc, noninductive load.

Type KR Magnetic Controllers. The "Dynamo" Plant, Ministry of the Electrical Industry, has begun manufacture of Type KR magnetic controllers (station control) to control reversible ac motors with wound rotors. These controllers have automatic starting and regenerative braking.

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Data for the controllers are as follows:

Type	Catalogue No	Current at 40% Duty Cycle (amp) Stator Circuit	Rotor Circuit	Control Limits for Maximum Relays (amp)	Rotor Voltage	Weight (kg)
KR-2	11137-1	60	165	50 - 150	Up to 250	130
KR-2	11137-2	110	165	130 - 400	Up to 250	130
KR-3	11145-1	225	165	200 - 550	Up to 500	150

Voltage of the main ac circuit, up to 500 v; voltage of dc control circuit, 200 v. "Forward" and "back" contactors mechanically interlocked.

Type VNV-110/600 High-Voltage Air Circuit Breakers. The Poltava Machine-Building Plant, Ministry of Electric Power Stations, has begun manufacture of this type of breaker, designed by the All-Union Electrical Engineering Institute (VEI), with the following specifications: rated voltage, 110 kv; rated current, 600 amp; interrupting capacity, 2,500,000 kva, maximum current interruption, 13,100 amp; interrupting time, 0.05 sec. The breaker ensures high-speed reclosing. Operating air pressure in breaker reservoir /tank/ is 20 atm. Over-all dimensions: length, 2,500 mm; width, 1,275 mm, height, 3,290 mm; weight single phase, 1,700 kg.

Disconnect Switches No II-IV. The "Elektroapparat" Plant, Ministry of the Electrical Industry, has begun manufacture of three-pole disconnect switches with linear contacts, of the RLV-III type. voltage, 6 and 10 kv; current, 400 and 600 amp. They are made in the following types: No II with one support and one through insulator per pole, with the rotating shaft of the knife blade on the through insulator; No III with one support and one through insulator per pole and the rotating shaft on the support insulator. No IV, for two through insulators per pole. The electrical characteristics of these insulators are the same as the characteristics of disconnect switch No I (for two support insulators per pole) as described in "Spravochnika zavodskogo energetika (Handbook of Plant Power Engineers) and reprinted in Promyshlennaya Energetika, No 5, 1949.

Type TTS-0.5 Current Transformers. Until November 1949, the Moscow Transformer Plant, Ministry of the Electrical Industry, had manufactured these current transformers for combined currents of 30-600/5 amp with an accuracy of 0.5 at a frequency of 50 cps. The plant plans to manufacture a new type of these transformers in 1950.

Type MKU-48 Relays. The Leningrad Telephone Plant (LTZ), Ministry of the Communications Equipment Industry, has begun manufacture of a Type MKU-48 Electromagnetic relay which will be extensively used in automatic and signalling systems.

The relay is designed for the following voltages: dc -- 24, 48, 60, 110, 220 v; ac -- 110, 127, 220, 380 v; continuous current -- 5 amp; operating time -- 0.03 sec. Power consumption: for dc up to 110 v -- 2.5 w, for 220 v (with auxiliary resistor) -- 5 w; for ac up to 220 v with lengthened armature, for an 8-spring /contact/ set -- 4 va, for a 10-spring set -- 5 va. Interrupting capacity of contacts in a dc circuit with inductive load (2 h) -- 50 w; in ac circuits up to 220 v -- 500 va.

Under these conditions, a relay can perform about one million operations, after which the contacts must be cleaned or the springs must be changed and readjusted.

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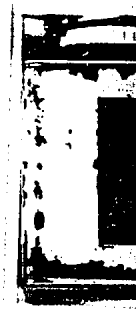

Specifications for the relay are as follows: without base and cover, dimensions -- 30 x 84 x 100 mm; weight -- 0.3 kg; with base and cap, dimensions -- 55 x 113 x 127 mm; weight -- 0.51 kg. Relays without base and cap are designed for installation on a general relay panel.

Relays may have the following eight combinations of contact grouping: 2 closing, 2 opening, 2 change-over, 4 closing, 4 opening, 2 closing and 2 opening, 2 closing and 2 changeover, 2 opening and 2 changeover (the two latter are only for relays without base and cap).

Type IBN Testing Units. Since 1949, the "Elektropul't" Plant, Ministry of Electric Power Stations, has been manufacturing Type IBN testing units and associated control plugs Type ShKN through which protective relays and measuring instruments are connected. The number of poles for the units and plugs may be 2, 4, 6, or 8. The presence of these units in measuring and protective circuits permits checking, regulating, and testing relays and instruments rapidly and safely during operation. Technical specifications for the units are as follows: rated current, 10 amp; rated voltage, 220 v; thermal stability, 300 amp for 1 sec; testing voltage, 2 kv.

Incandescent Reflector-Type Lamps. The Moscow Electric Lamp Plant, Ministry of the Communications Equipment Industry, is manufacturing incandescent lamps with mirrow reflectors for general illumination having the following data.

	Type of Lamp			
	ZN-5	ZN-6	ZN-7	ZN-8
Voltage (v)	127	127	220	220
Power (w)	300	500	300	500
Luminous flux (lumens)	4,300	7,500	3,600	6,400
Max power	318	529	311	524
Min luminous flux (lumens)	3,440	6,225	2,880	5,338

Mirror lamps are intended for general illumination, especially for large industrial premises. The lamps are made with a bulb of special shape, covered with a mirror-like layer inside which provides the desired light distribution without additional lighting fixtures.

The average life of the lamp at the rated voltage is 750 hr, at a voltage 15 percent higher than the rated voltage, 112 hr. The diameter of the bulbs of all lamps is the same, 177 mm. The base (in accordance with GOST 2520-48) is a Type Ye-40.

Type AMI-60 Oil Testing Apparatus. The Saransk Plant, Ministry of the Electrical Industry, has begun manufacture of Type AMI-60 apparatus to test the dielectric strength of transformer oil and other fluid dielectrics. A high-voltage transformer, 0.11/60 kv_{eff} is installed in the apparatus. The primary winding of the transformer is supplied through a regulating transformer, thus permitting smooth voltage changes. The apparatus is designed for connection to a 110/220 network. The secondary is rated at 3 kva. Over-all dimensions (without high-tension terminals for testing solid dielectrics): height, 850 mm; length along the front, 500 mm; width, 450 mm; weight, 130 kg.

Trolley Supports and Crane Current Collectors. The Riga Electric Machine Building Plant (REZ), Ministry of the Electrical Industry, has designed and started to manufacture collectors for a 380 v, 40-1,000 amp dc and ac, and trolley supports for 380 and 500 v, dc and ac, and crane current collectors.

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